REMARKS / ARGUMENTS

I. General Remarks

Please consider the application in view of the following remarks. Applicants thank the Examiner for her careful consideration of this application.

II. Disposition of Claims

Claims 1-32 are pending in this application. Claims 33-79 were cancelled in a previous response.

Claims 1-4, 12, 16-20, 28, and 32 stand rejected under 35 U.S.C. § 102(b). Claims 5-11, 13-15, 21-27, and 29-31 stand rejected under 35 U.S.C. § 103(a).

III. Rejections of Claims

A. Rejections of Claims Under 35 U.S.C. § 102(b)

Claims 1-4, 12, 16-20, 28, and 32 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,825,952 to Mzik ("*Mzik*"). Applicants respectfully disagree with each of these rejections.

In order to form a basis for a rejection under 35 U.S.C. § 102(b), a prior art reference must disclose each and every element as set forth in the claim. MANUAL OF PATENT EXAMINING PROCEDURE § 2131 (2005). Moreover, when a prior art reference discloses a numerical range that touches or overlaps the claimed range, the reference must disclose the claimed range with "sufficient specificity to constitute an anticipation under the statute." *Id.* at § 2131.03 (II). This question of "sufficient specificity" is fact dependent, and is similar to that of whether a person of ordinary skill in the art could "clearly envisage" a species from a generic teaching. *Id.*; *see id.* at § 2131.02 (citing *In re Petering*, 301 F.2d 676 (CCPA 1962) (disclosure of a generic chemical formula, without more, cannot anticipate a specific compound having that formula where "the generic formula encompasse[s] a vast number and perhaps even an infinite number of compounds")). For example, "[i]f the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range, depending on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with 'sufficient specificity' to constitute an anticipation of the claims." *Id.* at § 2131.03 (II).

Applicants respectfully assert that *Mzik* does not anticipate Applicants' invention under 35 U.S.C. § 102(b) because it does disclose every element of their claims with sufficient specificity.

1. Claims 1-4, 12, 16-20, 28, and 32

With respect to claims 1 and 17, the Final Office Action states:

> Mzik discloses a method of treating/fracturing a subterranean formation comprising the steps of: providing a servicing fluid comprising carbon dioxide and a hydrocarbon blend, wherein the hydrocarbon blend comprises at least about 65% hydrocarbons having from six carbons (C.sub.6) to eleven carbons (C.sub.11) (see abstract and column 2 lines 34-38); and placing the servicing fluid into the subterranean formation (see column 1 lines 12-15).

(Final Office Action at page 2.) In response to Applicants' previous arguments regarding these claims, the Final Office Action further states:

> With respect to claims 1-4, 12, 16-20, 28, and 32 the Applicant argues that the hydrocarbon component in Mzik could comprise a vast number, and even an infinite number, of different blends having concentrations of hydrocarbons having 6 carbons (C6) to 11 carbons (C11), and a person of ordinary skill cannot ascertain whether those concentrations fall within the range recited in claims 1 and 17. However, prior art which teaches a range within, overlapping, or touching the claimed range anticipates if the prior art range discloses the claimed range with sufficient specificity. In the instant case, the prior art range completely encompasses the claimed range. MPEP 2131.03 states: If the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range, depending on the other facts in the case, it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims (emphasis added). Absent showing of unexpected results within the claimed range, the Examiner finds that Mzik discloses the claimed range with sufficient specificity. The Applicant further argues that the concentrations of C_6-C_{11} hydrocarbons recited in claims 1 & 17 are necessary to optimize both the volatility and safety of the hydrocarbon blends. However, the mere assertion that the claimed hydrocarbons optimize volatility and safety is not a showing of unexpected results. The hydrocarbons of Mzik would necessarily be volatile and safe, as Mzik discloses hydrocarbons in the concentrations of C_6-C_{11}. The Applicant further points out that Mzik teaches adding 5% to 85% by volume of the hydrocarbon component. However, it is noted that the claim recites a limitation

> of at least 65%. As Mzik discloses a range from 5% to 85%, Mzik discloses at least 65%. MPEP 2131.03 states: If the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range, depending on the other facts in the case, it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims (emphasis added). However, the Applicant has not shown evidence of unexpected results, thus the Examiner finds that Mzik discloses the claimed range with sufficient specificity.

(Final Office Action at pages 7-8 (emphasis in original).) Applicants respectfully disagree, and assert that *Mzik* does not specifically disclose a hydrocarbon blend having the composition recited in claims 1 and 17.

Applicants respectfully submit that *Mzik* does not disclose a hydrocarbon blend having a concentration of hydrocarbons having 6 carbons (C_6) to 11 carbons (C_{11}) within the range recited in claims 1 and 17 with "sufficient specificity" to anticipate these claims. *Mzik* does disclose that the hydrocarbon component may be present in the fracturing fluids disclosed therein in an amount of 5% to 85% by volume. (*See Mzik* at col. 2, ll. 34-38). However, these hydrocarbon components could comprise a large number of different concentrations of C_6-C_{11} hydrocarbons that may or may not fall within the range recited in claims 1 and 17. Thus, *Mzik*'s broad and generic disclosure does not disclose the hydrocarbon blends recited in claims 1 and 17 with sufficient specificity to anticipate those claims.

The concentrations of C_6-C_{11} hydrocarbons recited in claims 1 and 17, among other reasons, optimize both the volatility and safety (*e.g.*, maintains the flash point above a certain temperature to prevent accidental ignition) of the hydrocarbon blends. Submitted herewith is the Declaration of Gary P. Funkhouser, which includes data regarding the volatility (*i.e.*, "bubble point") of certain hydrocarbon blends of the present invention, as well as comparative data regarding the volatility of hydrocarbon blends that fall within the scope taught by *Mzik* (*e.g.*, kerosine). As the data show, the hydrocarbon blends generically disclosed by *Mzik* have much lower bubble points, and thus will not exhibit the same level of volatility as those in Applicants' claims. These unexpected results show that the broad concentration ranges for C_6-C_{11} hydrocarbons disclosed in *Mzik* do not disclose the claimed range with "sufficient specificity" to anticipate Applicants' claims.

Therefore, Applicants respectfully submit that independent claims 1 and 17 are patentable over *Mzik*. Moreover, since "a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers," and since claims 2-4, 12, 16, 18-20, 28, and 32 depend, either directly or indirectly, from claim 1 or 17, these dependent claims are allowable for at least the same reasons. *See* 35 U.S.C. § 112 ¶ 4 (2004). Accordingly, Applicants respectfully request the withdrawal of these rejections.

2. Claims 2 and 18

With respect to claims 2 and 18, the Final Office Action states:

> Mzik discloses a hydrocarbon blend that comprises at least about 65% hydrocarbons having from seven carbons (C.sub.7) to ten carbons (C.sub.10) (see abstract and column 2 lines 34-38).

(Final Office Action at page 2.) In response to Applicants' previous arguments regarding these claims, the Final Office Action further states:

> With respect to claims 2 and 18, the Applicant argues that the disclose in Mzik does not enable a person of ordinary skill in the art to at one envisage a hydrocarbon blend that comprises at least about 65% hydrocarbons having seven carbons to ten carbons. However, as noted above, the prior art which teaches a range overlapping the claimed range anticipated if the prior art range discloses the claimed rang with sufficient specificity. In the instant case, absent a showing of unexpected results, the Examiner finds that Mzik discloses the range claimed in claims 2 and 18 with specific specificity.

(Final Office Action at pages 8-9.) Applicants respectfully disagree because *Mzik* does not disclose a hydrocarbon blend that comprises at least about 65% hydrocarbons having seven carbons (C_7) to ten carbons (C_{10}). *Mzik* only discloses the concentrations for broad ranges of hydrocarbon sizes, which may or may not fall within the ranges recited in claims 2 and 18. As discussed above, this does not disclose a hydrocarbon blend that comprises at least about 65% hydrocarbons having seven carbons (C_7) to ten carbons (C_{10}) with "sufficient specificity" to anticipate claims 2 and 18.

Therefore, Applicants respectfully assert that claims 2 and 18 are patentable over *Mzik* because it fails to disclose the hydrocarbon compositions recited therein, in addition to the reasons discussed in Section III.A.1. above. Accordingly, Applicants respectfully request the withdrawal of these rejections.

3. Claims 3 and 19

With respect to claims 3 and 19, the Final Office Action states:

> Mzik discloses a hydrocarbon blend where about 85% of the hydrocarbon blend comprises hydrocarbons having eight carbons (C.sub.8), hydrocarbons having nine carbons (C9), or a mixture of hydrocarbons having eight carbons (C.sub.8) and hydrocarbons having nine carbons (C9) (see abstract and column 2 lines 34-48).

(Final Office Action at page 2.) In response to Applicants' previous arguments regarding these claims, the Final Office Action further states:

> With respect to claims 3 and 19, Applicant argues that Mzik only discloses the concentrations for broad ranges of hydrocarbon sizes, which may or may not fall with the ranges in claims 3 and 19. As noted above, an overlapping range in the prior art anticipates the claimed invention, unless there is evidence of unexpected results.

(Final Office Action at page 9.) Applicants respectfully disagree because *Mzik* does not disclose a hydrocarbon blend that comprises at least about 85% hydrocarbons having eight carbons (C_8), hydrocarbons having nine carbons (C_9), or a mixture thereof. *Mzik* only discloses the concentrations for broad ranges of hydrocarbon sizes, which may or may not fall within the ranges recited in claims 3 and 19. As discussed above, this does not disclose a hydrocarbon blend that comprises at least about 85% hydrocarbons having eight carbons (C_8), hydrocarbons having nine carbons (C_9) with "sufficient specificity" to anticipate claims 3 and 19.

Therefore, Applicants respectfully assert that claims 3 and 19 are patentable over *Mzik* because it fails to disclose the hydrocarbon compositions recited therein, in addition to the reasons discussed in Section III.A.1. above. Accordingly, Applicants respectfully request the withdrawal of these rejections.

B. Rejections of Claims Under 35 U.S.C. § 103(a) Over *Mzik*

Claims 5, 6, 14, 15, 21, 22, 30, and 31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Mzik*. Applicants respectfully disagree with each of these rejections.

To form a basis for a § 103(a) rejection, a prior art reference must teach or suggest each element in the claim. MANUAL OF PATENT EXAMINING PROCEDURE § 2142 (2005). In order for the determination of optimum or workable ranges of certain variables to be considered "routine experimentation," "a particular parameter must be recognized as a result-effective variable, *i.e.*, a variable which achieves a recognized result." *Id.* at § 2144.05 (II.B.)

(emphasis added) (citing *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977), section titled "Only Result-Effective Variables Can Be Optimized"). Moreover, an applicant can rebut a presumption of obviousness based on a claimed range that falls within a prior art range by showing "that there are new and unexpected results relative to the prior art." *Id.* at § 2144.05 (III.) (citing *Iron Grip Barbell Co., Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1322, 73 USPQ2d 1225, 1228 (Fed. Cir. 2004)). *Mzik* does not adequately teach or suggest every element of the rejected claims, and the optimal concentration ranges recited those claims would not be discoverable through "routine experimentation." Therefore, Applicants respectfully assert that the rejected claims are patentable over *Mzik*.

1. Claims 5 and 21

With respect to claims 5 and 21, the Final Office Action states:

> Mzik teaches that a hydrocarbon component can be added in an amount of 5-85%. Mzik further teaches that the hydrocarbon component can be a C_5-C_{14} constituent. Mzik does not specifically teach a hydrocarbon blend with less than 1% hydrocarbons having more than ten carbons. However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend with less than 1% hydrocarbon having more than 10 carbons.

(Final Office Action at pages 3-4.) In response to Applicants' previous arguments regarding these claims, the Final Office Action further states:

> With respect to claims 5 and 21, Applicant argues that Mzik does not teach a hydrocarbon blend that comprises less than 1% hydrocarbon blends by indicating that the hydrocarbons used therein may have as many as 14 carbons. However, Mzik discloses a range of C_5 to C_{14} hydrocarbons, and with routine experimentation it could have been determined to use less than 1% of 10 hydrocarbons. Applicant further argues that the determination of ranges of concentrations of certain hydrocarbons recited in claims 5 and 21 would not be considered "routine experimentation" because Mzik does not teach or recognize that the concentration of hydrocarbons having more than 10 carbons achieves any particular result. However, the burden is not on the prior art reference to show that a claimed range achieves a particular result. As noted in MPEP 2144.05, Applicants can rebut a prima facie case of obviousness based on overlapping ranges by

> showing the criticality of the claimed range. Applicant has not shown the criticality of a blend that comprises less than 1% hydrocarbons having more than ten carbons.

(Final Office Action at page 9.) Applicants respectfully disagree, and assert that *Mzik* does not obviate claims 5 and 21.

As discussed in Section III.A.1. above, *Mzik* does not teach or disclose hydrocarbon blends having the composition recited in claims 1 and 17, from which claims 5 and 21 depend. Moreover, as acknowledged in the above-quoted portion of the Office Action, *Mzik* does not teach a hydrocarbon blend that comprises less than 1% hydrocarbons having more than ten carbons (C_{10}). Indeed, *Mzik* teaches away from such hydrocarbon blends by indicating that the hydrocarbons used therein may have as many as 14 carbons (C_{14}). (*See Mzik* at col. 2, ll. 34-38.)

Moreover, the determination of the optimum ranges of concentrations of certain hydrocarbons recited in claims 5 and 21 would not be considered "routine experimentation." Applicants respectfully reiterate that *Mzik* does not teach or recognize that the concentration of hydrocarbons having more than 10 carbons is a "result-effective variable," and thus the determination of optimum ranges of this variable cannot be characterized as "routine experimentation." *See* MANUAL OF PATENT EXAMINING PROCEDURE § 2144.05 (II.B.) (2005) (section titled "Only Result-Effective Variables Can Be Optimized"). Finally, as discussed in Section III.A.1. above, the Funkhouser Declaration submitted herewith shows that the hydrocarbon blends generically disclosed by *Mzik* have much lower bubble points, and thus will not exhibit the same level of volatility as those in Applicants' claims. These unexpected results show that the optimal concentration ranges recited in claims 5 and 21 would not be obvious to a person of skill in the art. *Id.* at § 2144.05 (III.). Therefore, Applicants respectfully assert that *Mzik* does not obviate claims 5 and 21, and request the withdrawal of these rejections.

2. Claims 6 and 22

With respect to claims 6 and 22, the Final Office Action states:

> Mzik teaches that a hydrocarbon component can be added in an amount of 5-85%. Mzik further teaches that the hydrocarbon component can be a C_5-C_{14} constituent. Mzik does not specifically teach a hydrocarbon blend with less than 1% hydrocarbons having fewer than seven carbons. However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine

> experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend with less than 1% hydrocarbon having fewer than seven carbons.

(Final Office Action at page 4.) In response to Applicants' previous arguments regarding these claims, the Final Office Action further states:

> With respect to claims 6 and 22, Applicant argues that Applicant argues that Mzik does not teach a hydrocarbon blend that comprises less than 1% hydrocarbon blends having fewer than 7 carbons by indicating that the hydrocarbons used therein may have as few as 5 carbons. However, Mzik discloses a range of C_5 to C_{14} hydrocarbons, an with routine experimentation it could have been determined to use less than 1% of 7 carbons. Applicant further argues that the determination of ranges of concentrations of certain hydrocarbons recited in claims 6 and 22 would not be considered "routine experimentation" because Mzik does not teach or recognize that the concentration of hydrocarbons having fewer than 7 carbons achieves any particular result. However, the burden is not on the prior art reference to show that a claimed range achieves a particular result. As noted in MPEP 2144.05, Applicants can rebut a prima facie case o obviousness based on overlapping ranges by showing the criticality of the claimed range. Applicant has not shown the criticality of a blend that comprises less than 1% hydrocarbons having fewer than 7 carbons.

(Final Office Action at pages 9-10.) Applicants respectfully disagree, and assert that *Mzik* does not obviate claims 6 and 22.

As discussed in Section III.A.1. above, *Mzik* does not teach or disclose hydrocarbon blends having the composition recited in claims 1 and 17, from which claims 6 and 22 depend. Moreover, as acknowledged in the above-quoted portion of the Office Action, *Mzik* does not teach a hydrocarbon blend that comprises less than 1% hydrocarbons having fewer than seven carbons (C_7). Indeed, *Mzik* teaches away from such hydrocarbon blends by indicating that the hydrocarbons used therein may have as few as 5 carbons (C_5). (*See Mzik* at col. 2, ll. 34-38.)

Moreover, the determination of the optimum ranges of concentrations of certain hydrocarbons recited in claims 6 and 22 would not be considered "routine experimentation." Applicants respectfully reiterate that *Mzik* does not teach or recognize that the concentration of hydrocarbons having fewer than 7 carbons is a "result-effective variable," and thus the determination of optimum ranges of this variable cannot be characterized as "routine

experimentation." *See* MANUAL OF PATENT EXAMINING PROCEDURE § 2144.05 (II.B.) (2005) (section titled "Only Result-Effective Variables Can Be Optimized"). Finally, as discussed in Section III.A.1. above, the Funkhouser Declaration submitted herewith shows that the hydrocarbon blends generically disclosed by *Mzik* have much lower bubble points, and thus will not exhibit the same level of volatility as those in Applicants' claims. These unexpected results show that the optimal concentration ranges recited in claims 6 and 22 would not be obvious to a person of skill in the art. *Id.* at § 2144.05 (III.). Therefore, Applicants respectfully assert that *Mzik* does not obviate claims 6 and 22, and request the withdrawal of these rejections.

3. Claims 14 and 30

With respect to claims 14 and 30, the Final Office Action states:

> Mzik teaches that a hydrocarbon component can be added in an amount of 5-85%. Mzik further teaches that the hydrocarbon component can be a C_5-C_{14} constituent. Mzik does not specifically teach a hydrocarbon blend with less than about 1% hydrocarbons having fewer than seven carbons about 5% hydrocarbons having seven carbons, about 44% hydrocarbons having eight carbons, about 43% hydrocarbons having nine carbons, about 8% hydrocarbons having ten carbons, and less than about 1% hydrocarbons having more than ten carbons. However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend comprising less than about 1% hydrocarbons having fewer than seven carbons (C.sub.7), about 5% hydrocarbons having seven carbons (C.sub.7); about 44% hydrocarbons having eight carbons (C.sub.8); about 43% hydrocarbons having nine carbons (C.sub.9); about 8% hydrocarbons having ten carbons (C.sub.10); and less than about 1% hydrocarbons having more than ten carbons (C.sub.10).

(Final Office Action at pages 4-5.) In response to Applicants' previous arguments regarding these claims, the Final Office Action further states:

> With respect to claims 14 and 30, Applicant argues that Mzik teaches away from the claimed ranges. However, as noted above, Mzik discloses a range of 5 to 14 carbons. Absent as showing of criticality, one having ordinary skill in the art would be able to determine through routine experimentation an ideal range of hydrocarbons. The applicant also argues that this could not be achieved through routine experimentation because Mzik does not

> teach or recognize that the concentration of hydrocarbons of these sizes achieves any particular result. However, the burden is not on the prior art reference to show that a claimed range achieves a particular result. As noted in MPEP 2144.05, Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range. Applicant has not shown the criticality of the claimed range.

(Final Office Action at pages 10-11.) Applicants respectfully disagree, and assert that *Mzik* does not obviate claims 14 and 30.

As discussed in Section III.A.1. above, *Mzik* does not teach or disclose hydrocarbon blends having the composition recited in claims 1 and 17, from which claims 14 and 30 depend. Moreover, as acknowledged in the above-quoted portion of the Office Action, *Mzik* does not teach a hydrocarbon blend that comprises less than about 1% hydrocarbons having fewer than seven carbons (C_7), about 5% hydrocarbons having seven carbons (C_7), about 44% hydrocarbons having eight carbons (C_8), about 43% hydrocarbons having nine carbons (C_9), about 8% hydrocarbons having ten carbons (C_{10}), and less than about 1% hydrocarbons having more than ten carbons (C_{10}). Indeed, *Mzik* teaches away from such hydrocarbon blends by indicating that the hydrocarbons used therein may have as few as 5 carbons (C_5) and/or as many as 14 carbons (C_{14}). (*See Mzik* at col. 2, ll. 34-38.)

Moreover, the determination of the optimum ranges of concentrations of certain hydrocarbons recited in claims 14 and 30 would not be considered "routine experimentation." Applicants respectfully reiterate that *Mzik* does not teach or recognize that the concentration of hydrocarbons of these sizes is a "result-effective variable," and thus the determination of optimum ranges of this variable cannot be characterized as "routine experimentation." *See* MANUAL OF PATENT EXAMINING PROCEDURE § 2144.05 (II.B.) (2005) (section titled "Only Result-Effective Variables Can Be Optimized"). Finally, as discussed in Section III.A.1. above, the Funkhouser Declaration submitted herewith shows that the hydrocarbon blends generically disclosed by *Mzik* have much lower bubble points, and thus will not exhibit the same level of volatility as those in Applicants' claims. These unexpected results show that the optimal concentration ranges recited in claims 14 and 30 would not be obvious to a person of skill in the art. *Id.* at § 2144.05 (III.). Therefore, Applicants respectfully assert that *Mzik* does not obviate claims 14 and 30, and request the withdrawal of these rejections.

4. Claims 15 and 31

With respect to claims 15 and 31, the Final Office Action states:

> Mzik teaches that a hydrocarbon component can be added in an amount of 5-85%. Mzik further teaches that the hydrocarbon component can be a C_5-C_{14} constituent. Mzik does not specifically teach a hydrocarbon blend comprising substantially no hydrocarbons having more than eleven carbons. However, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Routine experimentation would have led one having ordinary skill in the art to form a hydrocarbon blend comprising substantially no hydrocarbons having more than eleven carbons.

(Final Office Action at page 5.) In response to Applicants' previous arguments regarding these claims, the Final Office Action further states:

> With respect to claims 15 and 31, the Applicant argues that Mzik teaches away from the claimed ranges. However, as noted above, Mzik discloses a range of 5 to 14 carbons. Absent as showing of criticality, one having ordinary skill in the art would be able to determine through routine experimentation an ideal range of hydrocarbons. The Applicant also argues that this could not be achieved through routine experimentation because Mzik does not teach or recognize that the concentration of hydrocarbons of these sizes achieves any particular result. However, the burden is not on the prior art reference to show that a claimed range achieves a particular result. As noted in MPEP 2144.05, Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range. Applicant has not shown the criticality of the claimed range.

(Final Office Action at page 11.) Applicants respectfully disagree, and assert that *Mzik* does not obviate claims 15 and 31.

As discussed in Section III.A.1. above, *Mzik* does not teach or disclose hydrocarbon blends having the composition recited in claims 1 and 17, from which claims 15 and 31 depend. Moreover, as acknowledged in the above-quoted portion of the Office Action, *Mzik* does not teach a hydrocarbon blend that comprises substantially no hydrocarbons having more than eleven carbons (C_{11}). Indeed, *Mzik* teaches away from such hydrocarbon blends by indicating that the hydrocarbons used therein may have as many as 14 carbons (C_{14}). (*See Mzik* at col. 2, ll. 34-38.)

Moreover, the determination of the optimum ranges of concentrations of certain hydrocarbons recited in claims 15 and 31 would not be considered "routine experimentation." Applicants respectfully reiterate that *Mzik* does not teach or recognize that the concentration of hydrocarbons having fewer than 7 carbons is a "result-effective variable," and thus the determination of optimum ranges of this variable cannot be characterized as "routine experimentation." *See* MANUAL OF PATENT EXAMINING PROCEDURE § 2144.05 (II.B.) (2005) (section titled "Only Result-Effective Variables Can Be Optimized"). Finally, as discussed in Section III.A.1. above, the Funkhouser Declaration submitted herewith shows that the hydrocarbon blends generically disclosed by *Mzik* have much lower bubble points, and thus will not exhibit the same level of volatility as those in Applicants' claims. These unexpected results show that the optimal concentration ranges recited in claims 15 and 31 would not be obvious to a person of skill in the art. *Id.* at § 2144.05 (III.). Therefore, Applicants respectfully assert that *Mzik* does not obviate claims 15 and 31, and request the withdrawal of these rejections.

C. Rejections of Claims Under 35 U.S.C. § 103(a) Over *Mzik* in View of U.S. Patent No. 6,511,944

Claims 7-10, 13, 23-26, and 29 stand rejected under 35 U.S.C. § 103(a) over *Mzik* in view of U.S. Patent No. 6,511,944 to Taylor *et al.* ("*Taylor*"). With respect to these rejections, the Final Office Action states:

> With respect to claims 7-10 and 23-26, Mzik does not teach a service fluid comprising a gelling agent present in an amount in the range of from about 0.1% to about 2.5% by weight of the hydrocarbon blend. Taylor teaches a hydrocarbon servicing fluid comprising a gelling agent of ferric iron or aluminum polyvalent metal salt of a phosphoric acid ester present in an amount in the range of from about 0.1% to about 2.5% by weight of the hydrocarbon blend in order to minimize volatile phosphorous in refinery distillation towers (see column 3 lines 5-59 and column 6 lines 52-55). It would have been obvious to one having ordinary skill in the art to modify the servicing fluid of Mzik by adding a gelling agent of ferric acid in the amount of 0.1% to 2.5% as taught by Taylor et al. in order to minimize volatile phosphorous in refinery distillation towers.
>
> With respect to claims 13 and 29, Mzik does not teach a servicing fluid comprising a delayed gel breaker. However, Taylor et al. teaches adding a delayed gel breaker to a hydrocarbon servicing fluid in order to cause the hydrocarbon fracturing fluid to revert to a thin fluid that is produced back after fractures are formed in the

> subterranean formation (see column 5 lines 31-35). It would have been obvious to modify the servicing fluid of Mzik by adding a delayed gel breaker as taught by Taylor et al. in order to cause the hydrocarbon fracturing fluid to revert to a thin fluid that is produced back after fractures are formed in a subterranean formation.

(Final Office Action at pages 5-6.) In response to Applicants' previous arguments regarding these claims, the Final Office Action further states:

> With respect to claims 7-10, 13, 23-26, and 29, the Applicant argues that as Mzik does not teach or suggest a hydrocarbon blend having the composition recited in claims 1 and 17, the rejections of the claims 7-10, 13, 23-26, and 29 are improper. However, as noted above, Mzik does disclose and suggest a hydrocarbon blend having the composition recited in claims 1 and 17. Thus, the rejections of claims 7-10, 13, 23-26, and 29 remain.

(Final Office Action at page 11.) Applicants respectfully disagree with these rejections.

To form a basis for a § 103(a) rejection, a combination of prior art references must teach or suggest each element in the claim. MANUAL OF PATENT EXAMINING PROCEDURE § 2142 (2004). However, as discussed above, *Mzik* does not teach or suggest a hydrocarbon blend having the composition recited in claims 1 and 17, nor would those hydrocarbon blends be obvious to a person of skill in the art in view of *Mzik*. Nor does *Taylor* teach or suggest hydrocarbon blends having these compositions. *Taylor* teaches gelled hydrocarbon liquids generally, but does not discuss the compositions of those fluids with respect to the size of the hydrocarbons therein. (*See Taylor* at col. 4, ll. 27-37.)

Because this combination of references does not teach all elements of claims 1 and 17, the combination cannot obviate claims 1 and 17. Since "a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers," and since claims 7-10, 13, 23-26, and 29 depend, directly or indirectly, from claim 1 or 17, these dependent claims include the limitations of claims 1 or 17, that neither *Mzik* nor *Taylor* teaches or suggests. *See* 35 U.S.C. § 112 ¶ 4 (2004). Therefore, Applicants respectfully assert that claims 7-10, 13, 23-26, and 29 are allowable over the combination of *Mzik* and *Taylor*, and respectfully request the withdrawal of these rejections.

D. Rejections of Claims Under 35 U.S.C. § 103(a) Over *Mzik* in View of U.S. Patent No. 3,954,626

Claims 11 and 27 stand rejected under 35 U.S.C. § 103(a) over *Mzik* in view of U.S. Patent No. 3,954,626 to Greminger, Jr. *et al.* ("*Greminger, Jr.*"). With respect to these rejections, the Final Office Action states:

> Mzik does not teach a fracturing fluid which comprises a LPG. [Greminger], Jr. et al. teaches a servicing fluid which comprises LPG in order to provide a mixture having a higher critical temperature than carbon dioxide alone (see column 3 lines 29-32). It would have been obvious to modify the invention of Mzik by adding a LPG fluid to the servicing/fracturing fluid as taught by Greminger, Jr. et al. in order to provide a mixture having a higher critical temperature than carbon dioxide alone.

(Final Office Action at page 7.) In response to Applicants' previous arguments regarding these claims, the Final Office Action further states:

> With respect to claims 11 and 27, the Applicant argues that as Mzik does not teach or suggest a hydrocarbon blend having the composition recited in claims 1 and 17, the rejections of the claims 11 and 27 are improper. However, as noted above, Mzik does disclose and suggest a hydrocarbon blend having the composition recited in claims 1 and 17. Thus, the rejections of claims 11 and 27 remain.

(Final Office Action at pages 11-12.) Applicants respectfully disagree with these rejections.

To form a basis for a § 103(a) rejection, a combination of prior art references must teach or suggest each element in the claim. MANUAL OF PATENT EXAMINING PROCEDURE § 2142 (2004). However, as discussed above, *Mzik* does not teach or suggest a hydrocarbon blend having the composition recited in claims 1 and 17, nor would those hydrocarbon blends be obvious to a person of skill in the art in view of *Mzik*. Nor does *Greminger, Jr.* teach or suggest hydrocarbon blends having these compositions. Rather, *Greminger, Jr.* only teaches the use of fracturing fluids that comprise liquid carbon dioxide, an anhydrous alcohol, and a hydroxypropyl methylcellulose, but does not discuss the compositions of those fluids with respect to the size of the hydrocarbons therein. (*See Greminger, Jr.* at Abstract.)

Because this combination of references does not teach all elements of claims 1 and 17, the combination cannot obviate claims 1 and 17. Since "a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers," and

since claims 11 and 27 depend, directly or indirectly, from claim 1 or 17, these dependent claims include the limitations of claims 1 or 17, that neither *Mzik* nor *Greminger, Jr.* teaches or suggests. *See* 35 U.S.C. § 112 ¶ 4 (2004). Therefore, Applicants respectfully assert that claims 11 and 27 are allowable over the combination of *Mzik* and *Greminger, Jr.*, and respectfully request the withdrawal of these rejections.

SUMMARY

In light of the above remarks, Applicants respectfully request reconsideration and withdrawal of the outstanding rejections. Applicants further submit that the application is now in condition for allowance, and earnestly solicit timely notice of the same. Because this response has been filed within two months of when the Final Office Action was issued, Applicants respectfully request that the Examiner issue an advisory action if the Examiner does not find the claims to be allowable in light of the amendments and remarks made herein. Should the Examiner have any questions, comments or suggestions in furtherance of the prosecution of this application, the Examiner is invited to contact the attorney of record by telephone, facsimile, or electronic mail.

Applicants believe that no additional fees are due in association with the filing of this response. However, should the Commissioner deem that any additional fees are due, including any fees for extensions of time, Applicants respectfully request that the Commissioner accept this as a Petition Therefor, and direct that any additional fees be charged to the Deposit Account of Halliburton Energy Services, Inc., No. 08-0300.

Respectfully submitted,

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